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environmental SOLUTIONS



Draft Environmental Management Programme for the proposed development of Hennops Wedding Venue and Conference Centre on Portion 200 (a portion of portion 62) of Farm Hennopsrivier 489 JQ, Hennops River Valley, City of Tshwane Metropolitan Municipality, Gauteng Province

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LIST OF ACRONYMS

CoT	City of Tshwane Metropolitan Municipality
DAFF	Department of Agriculture, Forestry and Fisheries
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EMPr	Environmental Management Programme
GDARD	Gauteng Department of Agriculture and Rural Development
GPEMF	Gauteng Provincial Environmental Management Framework
GLES	Green Lantern Environmental Solutions (Pty) Ltd
I&AP's	Interested and Affected Parties
MSDSs	Management Safety Data Sheets
NEMA	National Environmental Management Act
NEM: BA	National Environmental Management Biodiversity Act
NEM: WA	National Environmental Management Waste Act
NWA	National Water Act
OHSA	Occupational Health and Safety Act
SHE	Safety, Health and Environmental Officer

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1. INTRODUCTION

Green Lantern Environmental Solutions cc (herein referred to as GLES) has been appointed by Mr Rofhiwa Nevondo as independent Environmental Impact Assessment Practitioners (EAP) to conduct an Environmental Impact Assessment (Basic Assessment) for the proposed development of Hennops Wedding Venue and Conference Centre, located in the Hennops River Valley, under the jurisdiction of City of Tshwane Metropolitan Municipality of Gauteng Province.

GLES has been appointed to undertake the Environmental Impact Assessment process in terms of the EIA Regulations of December 2014 (as amended on 07 April 2017), published in terms of Section 24(5) of the National Environmental Management Act (Act 107 of 1998). The proposed development triggers Environmental Impact Assessment (EIA) Regulations GNR 327 (Listing Notice 1) and GNR 324 (Listing Notice 3), therefore a Basic Assessment (BA) Process will be undertaken to obtain Environmental Authorisation before the project can commence.

2. PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

An EMPr is an important tool for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle. It is understood that any activity can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the project. An Environmental Management Programme (EMPr) is required for the proposed project as per the EIA Regulations, 2014 (as amended in 2017) promulgated in terms of the National Environmental Management Act (Act No 107 of 1998). The implementation of this EMPr remains the responsibility of the applicant.

In general, the purpose of this EMPr is to formulate mitigatory measures that should be made binding to the applicant, contractors and subcontractors during the construction of the proposed project, as well as measures that should be implemented during the operational and where applicable, phase. This EMPr is, therefore, a standalone document, which must be used on site during each phase of the development. It has been developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with the proposed development. The purpose of the EMPr is to:

- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Adopt the best practicable means available to prevent or minimize adverse environmental impacts;
- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the environment;
- Provide waste management practices based on prevention, minimization, recycling, re-use, treatment or disposal of wastes;
- Describe all monitoring procedures required to identify impacts on the environment; and,
- Serve as the guideline document during training of the employees

2.1 OBJECTIVES OF THE EMPR

This EMPr has been developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with the development throughout the project life cycle. The objectives of the EMPr are to:

- Ensure compliance with regulatory authority stipulations, guidelines which maybe local, provincial and/or national;
- Provide best practice guidelines, framework and ensure compliance through regular monitoring and auditing;
- Provide a standard for management of environmental issues pertaining to all phases of the proposed development;
- Identification of probable impacts and provision of mitigation measures;

2.2 SCOPE OF THE EMPR

In order to ensure a holistic approach to the management of environmental impacts during the planning, construction, operational and decommissioning phases of the proposed project, this EMPr sets out the methods by which proper environmental controls are to be implemented by the developer, contractor, sub-contractors, operational staff and all other parties involved. The EMPr is a dynamic document subject to influences and changes as are created by variations to the provisions of the project specification.

2.2.1 LAYOUT OF THE EMPR

The process which was followed in compiling this EMPr is in compliance with the NEMA EIA Regulations, 2014 (as amended in April 2017), and applies the principles of Integrated Environmental Management (IEM). The purpose of this EMPr is to formulate mitigation measures that are binding on the developer, contractor, sub-contractors and operational staff. In each of these phases environmental management must be practised to maintain sustainable development and to protect the environment. This EMPr will typically contain the following:

- The specific activity or potential impact that requires management;
- The mitigation measures to be implemented;
- The person responsible for implementation

2.2.2 PLANNING AND DESIGN PHASE

This section of the EMPr incorporates pro-active environmental management measures with the goal of attaining sustainable development which can be achieved during this phase. Pro-active environmental measures help minimize the chance of negative impacts occurring. Necessary corrective actions are proposed to further limit potential impacts.

2.2.3 CONSTRUCTION PHASE

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part

of the contract documentation and, therefore, the contractor and sub-contractors will be required to comply with the specifications to the satisfaction of the Site Manager.

2.2.4 OPERATIONAL PHASE

The operational phase of the proposed project will generate impacts that will require mitigation and minimisation. If proper management strategies are not implemented the impacts would accumulate and create environmental risks as well as health and safety hazards. This section will outline the measures to be taken after during the operational phase of the project. These specifications, and any other as deemed necessary by the developer and Operational Manager should be carried out accordingly.

2.2.5 DECOMMISSIONING PHASE

Though it is not deemed that the project will be decommissioned any time soon in the foreseeable future, the impacts and mitigation measures have been specified and will also be considered binding on the developer, contractor and sub-contractors.

3. PROJECT SCOPE

The development footprint is approximately 3,99 hectares and will include the construction and operation of the following:

- Wedding Hall/ Multi-purpose hall
- Chapel
- Changing rooms
- Chalets
- Guard house
- Walkways and paving
- Parking bays
- Pond
- Swimming pool
- Children's play area
- Marquee tent area
- Putt-putt area
- Outdoor ablution facilities
- Landscaping including planting of indigenous shrubs and lawn

The layout plan for the proposed development is shown overleaf as Figure 3-1.



FIGURE 3-2; PROJECT LOCALITY

4. LEGAL REQUIREMENTS

This EMP, which forms an integral part of the contract documents, informs the developer; contractor and sub-contractors of their duties in the fulfilment of the project objectives, with particular reference to the avoidance, management and mitigation of environmental impacts associated with the undertaking of the proposed activity. The developer should note that obligations imposed by the approved EMP are legally binding (in terms of environmental statutory legislation) and should be included in all contractual documentation relevant to the pre-construction, construction and operational phases of the development.

The developer/contractor and sub-contractors shall identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the design, construction and operational phases of the development must be complied with. The Table below outlines applicable legislation and is intended to serve as a guideline only and is not exhaustive:

TABLE 1: APPLICABLE LEGISLATION RELEVANT TO THE PROPOSED DEVELOPMENT

Title of legislation, policy or guideline	Applicability to the project	Administering authority
Constitution Act (Act No. 108 of 1996)	The right to an environment that is not harmful to the health and well-being of people will be protected.	The Parliament of South Africa
Basic Conditions of Employment Amendment Act, 2002 (Act No. 11 of 2002)	Employment of labour is regulated by this Act. The purpose of the Act is to give effect to the right to fair labour practices referred to in section 23(1) of the Constitution by establishing and making provision for the regulation of basic conditions of employment; and thereby to comply with the obligations of the Republic as a member state of the International Labour Organisation; and to provide for matters connected therewith.	Department of Labour
National Health Act (Act No. 61 of 2003)	To provide a framework for a structured uniform health system within the Republic, taking into account the obligations imposed by the Constitution and other laws on the national, provincial and local governments with regard to health services; and to provide for matters connected therewith.	Department of Health
National Environmental Management Act (Act No.107 of 1998)	Section 2 - defines the strategic environmental management goals and objectives of the government. Applies through –out the republic to the actions of all organs of state that may significantly affect the environment. Section 24 – provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.	GDARD

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	Section 28 – The developer has a general duty to care for the environment and to institute such measures may be needed to demonstrate such care	
National Environmental Management: Waste Management (Act No. 59 of 2008)	The proposed development will generate both hazardous and general waste as such the Act provide for the management of these.	GDARD/CoT
National Heritage Resources Act (Act No. 25 of 1999)	<p>Section 32- No person may ,without a permit issued by the responsible heritage resources authority destroy ,damage, excavate ,alter ,deface or otherwise disturb any archaeological or paleontological site.</p> <p>Section 34- no person may without issued by the South Africa Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage ,alter, exhume ,remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by local authority. Grave is widely defined in the Act to include the contents, headstone or other marker of such a place and any other structure on or associated with such place.</p>	South African Heritage Resources Agency
National Water Act (Act No. 36 of 1998)	The Act provides for the safe and regulated usage of water resources.	Department of Water and Sanitation (DWS)
Occupational Health and Safety Act (Act No. 85 of 1993)	Primarily aimed at ensuring the health and safety of persons at work and visitors. Specifies the basic systems that need to be in place and measures that need to be taken.	GDARD, Department of Labour

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National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004)	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.	GDARD/ CoT
National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	Provide for the protection of species and ecosystem that warrant national protection and the sustainable use of indigenous biological resources.	DAFF/GDARD/ CoT
South African National Roads Agency Limited and National Roads Act, 1988 (Act No. 7 of 1988).	SANRAL has a distinct mandate to finance, improve, manage and maintain the national road network.	SANRAL
National Road Traffic Act, 1996 (Act No. 93 of 1996)	All vehicles and relevant operators will adhere to the National Road Traffic Act, 1996 (Act No. 93 of 1996) and all regulations under this Act.	SANRAL/CoT
National Dust Control Regulations, 2012 (as amended in 2018)	The purpose of these Regulations is to prescribe general measures for the control of dust.	DEA, GDARD
National Veld and Forest Fire Act, 1998 (Act No 101 of 1998)	The purpose of this Act is to prevent and combat veld, forest and mountain fires.	DEA, GDARD

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<p>Gauteng Provincial Environmental Management Framework (GPEMF)</p>	<p>The Gauteng Provincial Environmental Management Framework is a legal instrument in terms of the Environmental Management Framework Regulations, 2010. The purpose of the regulations is to assist environmental impact management including EIA processes, spatial planning and sustainable development, the GPEMF has been taken into account to determine the applicable zone in which the proposed development falls under. The proposed site falls under <i>South African Conservation Area</i> and is located in a special control zone for conservation, recreation and tourism. The site also lies outside of the buffer area of the Cradle to Human Kind World Heritage Site</p>	<p>GDARD</p>
<p>Gauteng Provincial Government Noise Control Regulations</p>	<p>Provides for the governance of acceptable noise levels during the construction and operational phase of the proposed development.</p>	<p>GDARD</p>

5. PROJECT ROLES AND RESPONSIBILITIES

5.1 SAFETY, HEALTH AND ENVIRONMENTAL OFFICER (SHE)

The SHE's responsibilities are to:

- Monitor the implementation of the Environmental Authorisation (EA), EMPr and all other authorisations and/or permits issued during the construction phase of the project;
- Ensure site protection measures are implemented on site;
- Conduct monthly audits of the site according to the EMPr provisions, and report findings to the Contractor and Proponent;
- Compile reports highlighting any non-compliance issues as well as progress and compliance with the EA, EMPr and all other authorisation and/or permit conditions;
- Recommend corrective actions for any environmental non-compliance noted on site;
- To facilitate communication between I&APs, authorities and the Contractor and/or the Proponent;
- Provide environmental solutions and guidelines to any environmental problems arising;
- To train the Site Manager, Contractor and sub-contractors on the mitigation measures, and to ensure that the Contractor's employees have undergone induction on these measures;
- To keep records of all activities / incidents concerning the environment on site and to monitor the complaints register in order to get a resolution;
- Compilation of health and safety risk assessments;
- Establishment and monitoring of the project health and safety file;
- Take appropriate action if the specifications contained in the EMPr with regards to health and safety are not implemented and/or adhered to;
- Monitoring the Contractor and sub-contractor's health and safety performance;
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. The incidents include public involvement /complaints, health and safety incidents, incidents involving hazardous materials stored on site and non- compliance incidents.

5.2 SITE MANAGER

The Site Manager is responsible for overall management of the project and EMPr implementation. The following tasks will fall within his / her responsibilities:

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;
- Monitor site activities on a daily basis for compliance;
- Conduct internal audits of the construction site against the EMPr;
- Confine the construction site to the demarcated area, and take cognisance of any designated buffer and/or "no-go" areas;

- Ensuring the list of transgression issued by the SHE is available on request; and
- Rectify any transgressions through the implementation of corrective action;
- Ensure the implementation of remedial measures in the event of pollution incidents or environmental impacts;
- Review and approve construction methods where necessary; and
- Order the removal of any person(s) and/or equipment in contravention of the specifications of the EA, EMPr and all other authorisations/ permits issued.

5.3 CONTRACTOR

The Contractor is responsible for the overall execution of the activities envisioned in the construction phase including the implementation and compliance with recommendations and conditions of the EA, EMPr and any other authorisations/ permits. The Contractor shall therefore ensure compliance with this EMPr at all times during construction activities and maintain an environmental register which keeps a record of all environmental incidents which occur on the site during the construction phase. These incidents may include:

- Public involvement / complaints;
- Health and safety incidents;
- Incidents involving hazardous materials stored on site; and
- Non-compliance incidents

The Contractor is also responsible for the implementation of corrective actions issued by the SHE and Site Manager within a reasonable or agreed period of time.

5.4 OPERATIONAL MANAGER

The operational manager is responsible for overall management of the development during the operational phase. The following tasks will fall within his / her responsibilities:

- Be fully conversant with the EA, EMPr and all other authorisations/ permits issued;
- Ensure the implementation of any operational mitigation measures included in the EA, EMPr and all other authorisations/ permits issued;
- Ensure that remedial measures in the event of pollution and/or health and safety incidents are implemented; and
- Ensure the development and revision of policies with regards to the environment, health and safety aspects of the operational phase of the development.

5.5 PROPONENT

The proponent is responsible for overall management of the development throughout it's life cycle and shall:

- Be fully conversant with the EA, EMPr and all other authorisations/ permits issued;

- Ensure the implementation of the EA, EMPr and all other authorisations/ permits issued throughout the project life cycle;
- Ensure that remedial measures in the event of pollution incidents or environmental impacts are implemented;
- Order the removal of any person(s) and/or equipment in contravention of the specifications of the EA, EMPr and all other authorisations/ permits issued; and
- Ensure endorsement of policies with regards to the environment and health and safety aspects of the operational phase of the development.

6. GENERAL ENVIRONMENTAL MANAGEMENT

6.1 TRAINING AND ENVIRONMENTAL AWARENESS

All contractor personnel involved in construction work are required to undergo environmental induction on their obligations towards environmental controls and methodologies in terms of this EMPr, prior to commencing of construction activities. It is important to ensure that an appropriate level of environmental awareness is effectively communicated with all personnel involved with the project to ensure continued environmental due diligence and on-going minimisation of environmental impacts. Training needs should be identified based on the available and existing capacity of site personnel to undertake the required EMPr management actions and monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard. The environmental training is aimed to provide the following:

- promoting environmental awareness to the contractor, sub-contractor and construction workers;
- informing employees of all environmental legislation, guidelines and procedures applicable to the development;
- generic training on the implementation of environmental management specifications; and
- job-specific environmental training in order to understand the environmental features (especially environmentally sensitive features e.g. the Hennops River and associated buffer areas) of the construction site and the surrounding environment.

Training will be done in a verbal format in the form of on-site talks and demonstrations by the SHE and where deemed necessary the Contractor. The training will be a once-off event, however a refresher course will be done intermittently should the SHE or Site Manager deem it necessary. Furthermore, training shall be provided for all new personnel hired throughout the construction phase of the project. In addition to training, general environmental awareness will be fostered among personnel to encourage the implementation of environmentally sound practices throughout the construction phase. An Induction Report will be signed by the Contractor as well as all employees undergoing Induction, and records kept for auditing purposes and copies given to the SHE for filing.

6.2 ENVIRONMENTAL MONITORING

A monitoring programme will be implemented for the duration of the development of the proposed project. This programme will include:

- Establishing a baseline survey through the taking of photographs of identified environmental aspects (especially environmentally sensitive features e.g. the Hennops River and associated buffer areas) and existing disturbances /impacts occurring on site prior to construction;
- Frequent monitoring and audits will be conducted by the SHE for the remainder of the construction phase to ensure compliance to the EMP conditions, and where necessary make recommendations for corrective actions.
- Compilation of an audit report with a rating of compliance with the EMP, the SHE shall keep a photographic record of any damage to areas outside the demarcated site and construction area. The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. All claims for compensation emanating from damage should be directed to the SHE and Site Manager for appraisal. The contractor and/or sub-contractors shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from any adjacent landowners and/ or community as well as business owners. All complaints/claims shall be handled immediately to ensure timeous rectification / payment by the responsible party/parties.

6.3 RECORD KEEPING

The performance of construction workers shall be monitored by the SHE to ensure that all aspects raised are being adhered to accordingly. Where it is deemed necessary, the SHE will undertake refresher induction training or toolbox talks on aspects that he/she deems to be of necessity. The SHE must compile a status quo of the site prior to the commencement of construction activities. These will be used as terms of reference when monitoring the impacts. The following documents will be used to monitor the impacts of the development through comparison with the pre-development status quo:

- Incidents report – all the incidents and accidents that occurs at the site must be recorded in this document;
- Waste Generation and Management Checklist – the checklist will monitor the effectiveness of the waste management strategies implemented;
- Flora and Fauna Checklist – the checklist will be used to monitor the status of any translocated tree species occurring on site, determine the extent of indigenous vegetation cleared , monitor the state of riparian flora and faunal habitat, as well as the mortality rate of any fauna found existing on site;

All the incidents and accidents occurring at the site should be recorded accordingly and photographic records must be kept for all site incidents and accidents.

6.4 COMPLIANCE WITH THE EMP

A copy of the EMP must be kept on site at all times during the construction and operational phases of the project. The EMP will be binding on all personnel operating on the site and must be included within the Contractual Clauses. It should be noted that in terms of the National Environmental Management Act No 107 of 1998 (Section 28) those responsible for environmental damage must pay the repair costs both to the environment and human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The 'polluter pays' principle).

6.5 NON - COMPLIANCE WITH THE EMPR

The Contractor and his personnel shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities at the site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The SHE should be made aware of any complaints.

Any non-compliance with the agreed procedures of this EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to re-dress the cause shall be reported to GDARD and /or any other relevant authority for them to deal with the transgression, as it deems fit.

The Contractor is deemed not to have complied with the EMPr if, inter alia:

- There is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and roads;
- There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site, but caused by construction activities relating to the development;
- Environmental damage ensues due to negligence;
- Construction activities take place outside the defined boundaries of the site; and/or
- The Contractor fails to comply with corrective or other instructions issued by the SHE and/or Site Manager within a specific time period.

It is recommended that penalties be issued for the following less serious violations and any others determined during the course of work as detailed below:

- Littering on site;
- Lighting of illegal fires on site;
- Any persons, vehicles or equipment related to the Contractor's operations found within any designated "no-go" areas including the Hennops River and associated buffer area;
- Excess dust or excess noise emanating from site;
- Possession or use of intoxicating substances on site;
- Any vehicles being driven in excess of designated speed limits.

6.6 EMERGENCY PREPAREDNESS

The Contractor shall compile and maintain environmental emergency procedures to ensure that there will be an appropriate response to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the project life cycle. Such activities may include, inter alia:

- Accidental exposure of employees to hazardous substances;

- Accidental fires;
- Accidental spillage of hazardous substances;
- Accidental toxic emissions into the air.
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans shall include:

- Emergency organisation (manpower) and responsibilities, accountability and liability;
- A list of key personnel and contact details;
- Details of emergency services available (e.g. the fire department, spill clean-up services, etc.);
- Internal and external communication plans, including prescribed reporting procedures where required by legislation;
- Actions to be taken in the event of different types of emergencies;
- Incident recording, progress reporting and remediation measures required to be implemented;
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release;
- Training plans, testing exercises and schedules for effectiveness.

The site personnel shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the National Environmental Management Act, 1998 (Act No 107 of 1998), the National Water Act, 1998 (Act No 36 of 1998), National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) and all other pertinent legislation.

6.7 INCIDENT REPORTING AND REMEDY

If a leakage or spillage of hazardous substances occurs on site, the area must be contained immediately. The source of the leak must be identified as soon as the leakage is noticed. The contaminated soil must be removed and be remediated. All the chemicals and equipment must be contained within the development footprint and access by animal to contaminated areas should be fully restricted. Where the spills or leakages effect would expand beyond the construction site footprint local emergency services must be immediately notified of the incident. The following information must be provided:

- The location;
- The nature of the load;
- The extent of the impact; and
- The status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

6.8 PENALTIES

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in this EMP, the developer and/or contractor shall be liable.

The following violations, and any others determined during the course of work, should be penalised:

- Hazardous chemical/oil spill that is not cleaned up within 24 hours;
- Unauthorised removal/damage to flora and fauna (including riverine flora and fauna) present on site;
- Uncontrolled/unmanaged erosion or exacerbated erosion in areas already prone to erosion;
- Pollution of watercourses i.e. Hennops River and associated buffer areas;
- Littering and dumping of waste on site.

7. DETAILED ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

The table below forms the core of this EMP, as it indicates the various actions (mitigation measures) that will be undertaken, responsible persons to ensure adherence and timeframes of implementation during the pre-construction, construction and post construction phases of the project.

TABLE 2; DETAILED ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

ENVIRONMENTAL ASPECT	IMPACT DESCRIPTION	MITIGATION MEASURES/ ACTIONS TO BE IMPLEMENTED	RESPONSIBLE PERSONS	PHASE/TIMEFRAME
PRE-CONSTRUCTION PHASE				
Legal Compliance	<ul style="list-style-type: none"> Delays in the project implementation due to unavailability of required authorisations and/or permits, Delays in the project implementation due to non-compliance of authorisations/permit conditions. 	<ul style="list-style-type: none"> Appointment of suitably qualified and experienced personnel, knowledgeable in issues relating to legal compliance for the successful implementation of the project, Ensure that all necessary authorisations and permits are acquired before commencement of the construction phase. Adhere to authorisation and/or permit conditions at all times, Report to regulatory authorities according to the stipulated time frames stated in the authorisations and/or permits. 	<ul style="list-style-type: none"> SHE Site Manager Proponent 	From the pre-construction phase throughout the project life cycle.
Environmental Awareness and Training	<ul style="list-style-type: none"> Environmental degradation and harm to the environment (this can include pollution of water, soil, and ecosystems as well as harm to employees and wasteful practices in terms of resource use and waste management) 	<ul style="list-style-type: none"> Communication (inclusive of toolbox talks) with regards to all environmental and health and safety issues will be undertaken with all personnel involved in the project. All employees are required to attend onsite Environmental Awareness/Training prior to commencing work on site. All new personnel joining the project team (at any given time of the project) shall be inducted appropriately before commencement of work. When it is deemed necessary refresher awareness training courses will 	<ul style="list-style-type: none"> SHE Site Manager Contractor 	Pre-Construction/ Construction (intermittently as required)

	<p>due to lack of education/awareness of contractors and workers.</p>	<p>be conducted during any point of the project implementation.</p> <ul style="list-style-type: none"> • Accurate records of all training undertaken will be kept on site. 		
		<ul style="list-style-type: none"> • In as far as possible suitable, trained, competent and certified personnel shall partake of particular duties at any point in the project implementation. 	<ul style="list-style-type: none"> • Site Manager • Contractor 	Pre-Construction/ Construction
Socio – Economic Issues	<ul style="list-style-type: none"> • Creation of employment opportunities for locals and utilisation of local businesses and SMME's 	<ul style="list-style-type: none"> • Liason with the ward councillor, local work committees and all other relevant local authorities will be undertaken prior to the hiring of workers to ensure adequate inclusion of local labour force. • In as far as possible adequately skilled local workers commensurate with the assigned work will be sourced from the community and surrounding areas. In as far as applicable local businesses and SMMEs should be contracted for services that can be offered by the local businesses. 	<ul style="list-style-type: none"> • Site Manager • Contractor • Proponent 	Pre- construction/ Construction
	<ul style="list-style-type: none"> • Relations with community, local business owners, adjacent landowners and land occupants 	<ul style="list-style-type: none"> • Adequate notification of the proposed project will be given to the community, local business owners, adjacent landowners and land occupants. • Open communication and adherence to any specific agreements initially agreed on with the community, local business owners, adjacent land owners and land occupants will be maintained throughout the duration of the project. • A complaints register will be kept on site to ensure the recording and resolving of any arising issues. 		

<p>Site layout/selection and pre-establishment</p>	<p>Poor planning/selection/lay out of site resulting in loss of flora</p>	<ul style="list-style-type: none"> • A site layout plan will be established with the assistance/approval of the SHE to ensure the demarcation of environmentally sensitive areas such as the Hennops River and the associated 40m buffer zone. The construction camp site will not be located near the buffer zones. Any other identified sensitive areas will be demarcated as “no-go” areas. • The site layout plan will show the location of temporary buildings/structures, laydown areas, parking areas, vehicle service areas and wash bays, fuel storage areas/ hazardous substance storage areas, stockpile areas as well as temporary ablution facilities. Temporary ablution facilities shall be placed outside of the 1:100 yr flood line. • Photographic records of the site (pre-construction, construction and post construction phases) and immediate surrounding work areas shall be documented. 	<ul style="list-style-type: none"> • Site Manager • SHE 	<p>Pre-Construction</p>
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ENVIRONMENTAL ASPECT	IMPACT DESCRIPTION	MITIGATION MEASURES/ ACTIONS TO BE IMPLEMENTED	RESPONSIBLE PERSONS	PHASE/FREQUENCY
CONSTRUCTION PHASE				
Site Establishment	<ul style="list-style-type: none"> Environmental degradation of the site, sensitive areas and the surrounding environment. 	<ul style="list-style-type: none"> No unauthorised pedestrian or vehicular access shall be allowed into fenced, off-limit areas. Fencing shall be kept neat and well maintained at all times. If fencing is removed temporarily for the execution of work, it will be re-instated as soon as practicable. Until re-instatement, the working areas will be demarcated by means of danger-tape barricading. Breaches in the fencing will be repaired within 24 hours. The area specified for the storage of hazardous materials and vehicle maintenance will be bunded to avoid contamination of the soil. The site will be fenced off to prevent access by unauthorised persons. Site buildings/structures to be established will mostly be of a container or prefabricated type. Temporary ablution facilities will be used and these will be placed outside of the 1:100 yr flood line. An adequate number of toilets, to be placed within a reasonable working distance will be utilised. These toilets shall be emptied regularly and it will be ensured that no sewerage waste is emptied in the surrounding Hennops River. There shall be minimal vegetation clearance in as far as possible (areas that are already denuded 	<ul style="list-style-type: none"> SHE Site Manager 	Construction

		<p>shall be maximised for construction purposes), which will be limited to areas marked for site establishment and working areas.</p> <ul style="list-style-type: none"> • Topsoil shall be cleared of woody vegetation, and specifically exotic vegetation, before ripping and removing. The topsoil, including the existing grass cover will only be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process. • Soil stockpiles will not be higher than 2.5m or stored for a period longer than one year. The slopes of soil stockpiles will not be steeper than 1 vertical to 2.5 horizontal. No vehicles will be allowed access onto the stockpiles after they have been placed. Soil stockpiles will be placed outside the 1:100 flood line. • All vehicles, plant and machinery will be allocated a dedicated parking area in the camp site. No storage of vehicles, plant and machinery will be allowed outside of the designated area. • No open fires will be allowed on site and burning of any waste or rubble will be strictly monitored. Adequate and well maintained fire fighting equipment (according to the fire hazard strategies) will be maintained on site during the construction period (at least two all-purpose 12.5 kg extinguishers). Welding, gas cutting or cutting of metal will only be undertaken in designated areas inside the construction camp. 		
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		<ul style="list-style-type: none"> • Clean, safe drinking water will be supplied to all employees on site. • In as far as practical no trees shall be removed for the purposes of site establishment. 		
Watercourses (Hennops River and associated 40m buffer zone)	<ul style="list-style-type: none"> • Hydrocarbon pollution • Deterioration of water quality • Disturbance/ destruction of aquatic habitats and ecosystems • Disturbance/ destruction of riparian vegetation 	<ul style="list-style-type: none"> • A buffer zone of 40m from the Hennops River should be demarcated and designated as a “No-Go area”. The SHE should assist in the demarcation of this buffer area, as well as identification of laydown and storage areas including stockpile areas before commencement of construction activities. Strictly no development and/or any other construction activities (including clearance of vegetation and utilisation of laydown area and storage areas) within the riverine area and demarcated buffer area should be undertaken. All contractors and sub-contractors must be made aware of the sensitivity of the area before the commencement of construction activities. • Minimum vegetation clearance in areas adjacent to the demarcated buffer zone and riparian woodland area should be undertaken to ensure minimal occurrence of soil erosion and run off. • Portable sanitation facilities should not be placed within 100 metres of the Hennops River and any boreholes, as well as outside of the 1:100 yr flood line. The sanitation facilities should be emptied frequently by an appointed service provider. • Adequate number of bins should be placed throughout the construction site and furthermore near the buffer area to promote proper disposal of 	<ul style="list-style-type: none"> • SHE • Site Manager 	Construction (Daily monitoring)

		<p>waste. These bins should be clearly labelled for the adequate separation of the various waste types e.g. recyclable waste. Hazardous waste should only be stored at the designated waste storage area and should be disposed of by an appointed service provider at a suitably licensed landfill site.</p> <ul style="list-style-type: none"> • No maintenance of vehicles should be undertaken within the 1:100 yr flood line. Faulty and/or immobile vehicles (including vehicles with leakages) should also not be placed within the 1:100 yr flood line. • All hazardous substances should be stored on an impervious surface in a designated bunded area (at the camp site) able to contain 110% of the total volume of materials stored. • All earth moving vehicles and equipment should be regularly maintained to ensure their integrity and reliability. No repairs should be undertaken beyond the established laydown areas. Concrete mixing should be undertaken on an adequately slabbed area. • Frequent monitoring of the riverine and “no-go” areas should be undertaken to ensure that all prohibited activities are not being undertaken. • Testing of water quality should be undertaken frequently to ensure that the river is not being contaminated. Records of the water monitoring should be kept on site. • No construction material / rubble/ waste/ litter and hydro carbon pollutants such as oil will be 		
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		<p>allowed to be dumped into the river. No washing of clothes or vehicles will be allowed in the river.</p> <ul style="list-style-type: none"> • All hazardous substances will be stored on an impervious surface in a designated bunded area (at the camp site) able to contain 110% of the total volume of materials stored. • All earth moving vehicles and equipment will be regularly maintained to ensure their integrity and reliability. No repairs will be undertaken beyond the established laydown areas. • No dumping of waste, rubble and other construction material will be allowed and strict monitoring will be undertaken (penalties will also be imposed as deemed necessary). • Temporary roads and access routes should not be placed within the designated “no-go area”. In as far as practical existing access roads located away from the riparian area should be utilised 		
Flora and fauna	<ul style="list-style-type: none"> • Fragmentation/ loss of species diversity and habitat • Spread of alien and invasive species 	<ul style="list-style-type: none"> • A suitably qualified environmental officer should be appointed prior to commencement of construction activities. It is recommended that a Reconnaissance Survey be undertaken by an ecologist before the commencement of the development, ideally in the growing season: November-April, to further confirm the findings of the Ecologist and identify any other species including any listed red data species. • A buffer zone of 40m from the Hennops River should be demarcated and designated as a “No-Go area”. The environmental officer should assist 	<ul style="list-style-type: none"> • SHE • Ecologist • Site Manager 	Construction

		<p>in the demarcation of this buffer area, marking of the identified medicinal plants, as well as identification of laydown and storage areas including stockpile areas before the commencement of construction activities.</p> <ul style="list-style-type: none"> • Strictly no development and/or any other construction (including clearance of vegetation and utilisation of laydown and storage areas) within the riverine area and demarcated buffer area should be undertaken. All contractors and sub-contractors must be made aware of the sensitivity of the area before the commencement of construction activities. • Only the necessary bulbous or succulent plant species occurring in the natural grassland area should be removed. All plant species removed should then be temporarily planted in a suitable container and replanted in suitable areas after construction activities have been completed. It is recommended that only indigenous vegetation be utilised for landscaping purposes. • In as far as practically possible minimal vegetation clearance should be undertaken in the natural grassland area, to ensure connectivity of the area. Where vegetation needs to be “opened” to gain access it is recommended that the herbaceous species are cut short rather than removing them. • A search and rescue operation for faunal species occurring within the development area should be 		
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		<p>conducted prior to the commencement of construction activities.</p> <ul style="list-style-type: none"> • All temporary stockpile areas, litter and dumped material and rubble must be removed during and on completion of construction activities and none stored within the natural grassland and riparian area. • A Re-vegetation and Rehabilitation Plan should be compiled for usage by contractors and sub-contractors to rehabilitate disturbed areas. All translocated plants should be re-utilized for rehabilitation purposes. • Vegetation clearance should be restricted to the development footprint, and undertaken in a phased manner to allow any existing animals to move away from the site. No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site. No hunting with firearms (shotguns, air rifles or pellet guns) or catapults should be permitted on the property as well as adjacent areas. • All alien vegetation should be eradicated within the study site especially within the natural grassland area. Removal of the alien and weed species encountered on the site must be undertaken in adherence to applicable legislation e.g. (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998). 		
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		<ul style="list-style-type: none"> • The use of herbicides should only be allowed after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent. Application should be under the direct supervision of a qualified technician. All surplus herbicide should be disposed of in accordance with the supplier's specifications. • Vegetation clearing activities and earth scraping should ideally be undertaken in the dry season as this is the period when the majority of plant and animal species are either dormant or finished with their propagation/breeding activities. • No burning of vegetation will be allowed at the camp site and working areas. Fires will only be permitted in designated, fire-controlled areas. All employees shall be properly trained in the use of the appropriate fire fighting equipment and it will be ensured that such equipment is on hand at all times. • No domestic pets will be allowed on site. • Structures (e.g. gutters, drains, sumps, ditches) will be designed, in as far as possible, so that they do not act as pitfall traps for small creatures, i.e. they should either have gently sloping edges or be adequately covered to prevent creatures from falling into them • Dumping of construction rubble and other waste material in the areas earmarked for exclusion will be prevented, through fencing and strict monitoring and enforcement of penalties. 		
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		<ul style="list-style-type: none">• No faunal species will be disturbed, trapped, hunted or killed throughout the project duration.		
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<p>Storm water management</p>	<ul style="list-style-type: none"> • Erosion of topsoil • Potential for increased occurrence of flooding • Potential for soil erosion 	<ul style="list-style-type: none"> • No excavated soil/stockpiling of soil, spoil material or rubble will be stored or dumped within any demarcated environmentally sensitive or “no-go” areas. • Any erosion channels noticed shall be backfilled and consolidated immediately and the area restored to its previous condition (cognisance should be taken of areas along the eastern boundary of the site including the immediate sites adjacent to the boundary). All erosion damage shall be repaired as soon as possible. • Run-off control structures such as silt fences/ barriers (where deemed necessary) will be installed prior to commencement of the construction activities. • Silt traps and oil traps shall be incorporated into the drainage systems where deemed necessary to minimise pollution risk. • Stockpiles will be covered especially during rainy seasons in order to avoid erosion. • Storm water must be diverted from construction works and roads and must be managed in such a manner as to disperse run-off and to prevent the concentration of storm water flow. • An adequate storm water management plan shall be implemented that will ensure dissipation of energy of the storm water before it is released. 	<ul style="list-style-type: none"> • Site Manager • SHE 	<p>Construction</p>
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<p>Geology and soils</p>	<ul style="list-style-type: none"> • Potential for soil erosion, degradation and loss of topsoil • Destabilisation of surface geology and soil structure 	<ul style="list-style-type: none"> • Areas most susceptible to erosion will be protected by installing all the necessary temporary and permanent drainage works as soon as possible and including measures such as installation of erosion berms. Meticulous maintenance will be undertaken to ensure minimisation of erosion. • Any erosion channels developed during the construction period shall be backfilled and compacted and the areas restored to a proper condition. • The stockpile area should be positioned outside the demarcated "no-go" areas and outside of the 1:100 yr flood line. • Earthworks and drainage measures should be designed in such a way as to prevent ponding of, or high concentrations of, storm water or groundwater anywhere on the site, both during and after the development. • All excavation works to be carried out in accordance with the requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). • Landscaping activities and re-vegetation will occur as soon as practical after completion of earthworks and construction activities within the immediate area. 	<ul style="list-style-type: none"> • SHE • Site Manager • Contractor 	<p>Construction</p>
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		<ul style="list-style-type: none"> • All topsoil will be removed and stockpiled on site. Stockpiles will be covered especially during rainy seasons in order to avoid erosion. Soil and construction material stockpiles are to be bermed to prevent leachate and polluted runoff. • Topsoil shall be cleared of woody vegetation, and specifically exotic vegetation, before ripping and removing. The topsoil, including the existing grass cover will only be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process. • Soil stockpiles will not be higher than 2 m or stored for a period longer than one year. No vehicles will be allowed access onto the stockpiles after they have been placed. • Dust suppression of stockpiles older than a month will be undertaken with either water or a biodegradable chemical binding agent. 		
Visual intrusion	-Visual intrusion on natural aesthetics of the area due to construction activities e.g. campsite	<ul style="list-style-type: none"> • Siting of the development and structures e.g. waste storage facilities; change rooms and ablution facilities should take sensitive receptors into consideration, in as far as practically possible. The natural aesthetic of the area must be duly considered. • Appropriate screening measures/ material should be utilised to reduce visual impacts. The structures to be constructed should ensure limited use of highly reflective materials and paints. 		

		<ul style="list-style-type: none"> Refuse bins should be placed at strategic positions to prevent littering and visual impact. All stockpiles should be placed and covered in a manner that will not cause visual intrusion due to their height or cover material utilised. 		
Heritage	Disturbance/ destruction of historical artefacts during excavation works and/or construction activities.	<ul style="list-style-type: none"> All employees will be adequately trained on the procedures to be undertaken if any artefacts are discovered. Employees will further be concetised on the potential types of artefacts that can be encountered (e.g. pottery, stone tools, remnants of stone-walling, graves, fossils). If any artefacts are discovered during excavation works and/or construction activities, all construction activities within a radius of at least 50m of the discovery area will be stopped immediately and the area demarcated by danger tape. Accordingly, a professional archaeologist and/or SAHRA official will be promptly contacted. 	<ul style="list-style-type: none"> SHE Contractor 	Construction
Concrete Mixing	Contamination of soil and ground water resources	<ul style="list-style-type: none"> Concrete mixing will be confined to designated areas and ad hoc mixing will be avoided. Concrete mixing will be undertaken on concrete trays or impervious surfaces/ materials. All waste concrete will be disposed of at an approved licensed landfill. No storm water will be allowed to flow through any concrete mixing areas to minimise the risk of pollution. 	<ul style="list-style-type: none"> SHE Contractor 	Construction

<p>Oil spillages and hazardous chemicals management</p>	<ul style="list-style-type: none"> • Pollution of water and soil resources • Destruction of flora and faunal species/ species habitats and ecosystems 	<ul style="list-style-type: none"> • Depending on the nature and extent of the spill, contaminated soil will be either excavated and removed or treated on-site. The SHE will determine the precise method of treatment of polluted soil. If the spillage occurs on an impermeable surface such as cement or concrete, the surface spill will be contained using oil absorbent materials. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal at a licensed landfill site. Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site. • Surface water draining of contaminated areas containing oil and petrol will be channelled towards a sump which will separate these chemicals and oils. • In the case of pollution of any surface or groundwater, the Department of Water and Sanitation must be informed immediately. • All hazardous substances will be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. • Material safety data sheets (MSDSs) will be clearly displayed for all hazardous materials. • The integrity of the impervious surface and bunded area will be inspected daily and any maintenance 	<ul style="list-style-type: none"> • SHE 	<p>Construction</p>
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		<p>work conducted will be recorded in a maintenance report.</p> <ul style="list-style-type: none"> • Oil spill kits will be kept on site and all personnel will be adequately trained on the usage of these in the event of oil spillage. • All earth moving vehicles and equipment will be regularly serviced and maintained to ensure their integrity and reliability. Dip trays will be utilised for any standing vehicles especially those that are being repaired. No repairs will be undertaken beyond the contractor laydown area. 		
<p>Access roads and accommodation of traffic</p>	<ul style="list-style-type: none"> • Traffic congestion • Poor maintenance of roads 	<ul style="list-style-type: none"> • Existing access roads will be utilised in as far as possible and will not be blocked or impeded by construction vehicles. If this is unavoidable, adequate prior planning will be implemented to ensure that safety and access to routes is maintained. Access assessment shall consider the site distance and position in relation to other intersections as well as the safety of the users of those accesses. • All new temporary access roads to be constructed will only be constructed with the approval of the Engineer. All temporary access roads no longer required, shall be decommissioned, ripped and land rehabilitated to the original land use. • Where necessary alternative and feasible routes for both vehicles and pedestrians will be provided for, with clear detouring and construction warning signs set out at all access points to the site. • All necessary way leaves and approvals from the Gauteng Department of Roads and Transport 	<ul style="list-style-type: none"> • SHE • Site Manager 	<p>Construction</p>

		(GDRT) and/or the CoT Traffic Engineering & Roads Department must be obtained prior to the commencement of the construction phase.		
Dust	Dust emissions from vehicular movements and stockpile areas.	<ul style="list-style-type: none"> The location and treatment of soil and material stockpiles will take into consideration the prevailing wind directions and the position of adjacent dwellings. Dust suppression techniques (i.e. spraying water) will be employed to minimize dust generation. All material loads will be adequately covered during transportation. Vehicle speeds should be limited to 30 kilometres per hour on gravel and dirt roads. The clearing of the site will be limited to the absolute minimum required to conduct construction activities. 	<ul style="list-style-type: none"> SHE Contractor 	Construction
Waste Management	<ul style="list-style-type: none"> Littering Visual nuisance to the public and generation of odour 	<ul style="list-style-type: none"> A weekly litter patrol of the camp site and working areas will be conducted. Large rubbish bins will be placed at strategic points around the camp site. General refuse and rubbish will be removed from site on a weekly basis. Rubble and upgrading refuse will be collected and removed weekly. Where possible, construction waste on site will be reused or recycled. Burning of waste material will not be permitted except under special circumstances and with prior approval/notification of the Project Manager. All waste (general & hazardous) generated during the construction phase will be disposed of at appropriately licensed landfill sites. 	<ul style="list-style-type: none"> SHE 	Construction

		<ul style="list-style-type: none"> In as far as possible recycling of waste will take place on site and items will be separated into paper, glass, metal, plastic, general waste and hazardous waste. 		
Noise	Noise pollution on neighbouring businesses and adjacent land owners and occupants.	<ul style="list-style-type: none"> All construction activities will be undertaken according to daylight working hours between the hours of 07:00 – 17:00 on weekdays and 7:30 – 13:00 on Saturdays. No construction activities will be undertaken on Sunday. All equipment will be equipped with standard silencers. Silencer units in vehicles and equipment will be kept in good working order. All earth moving vehicles and equipment will be regularly maintained to ensure their integrity and reliability. Construction staff working in area where the 8-hour ambient noise levels exceed 60 dBA will be supplied with the appropriate Personal Protective Equipment (PPE). All operations will meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). 	<ul style="list-style-type: none"> SHE 	Construction
Health and Safety	Potential for accidents and injuries to workers.	<ul style="list-style-type: none"> All employees will be given adequate Personal Protective Equipment (PPE) including dust masks. 	<ul style="list-style-type: none"> SHE 	Construction

		<ul style="list-style-type: none"> • Environmental and safety awareness trainings will be held frequently with workers. • All incidents will be recorded and rectified. The record will be filed on site. • Toolbox talks will be conducted every morning before work commencement • Personnel will be trained on fire fighting and fire extinguishers will be placed in all relevant areas. Personnel will also be trained on first aid and first aid boxes will be readily available on site. • Access to the construction site will be controlled. 		
Security	Injuries and fatal accidents and theft of equipment.	<ul style="list-style-type: none"> • Security guards will be placed at all entrances points to the site. • Temporary security fencing around the development site will be erected before construction commences. 	<ul style="list-style-type: none"> • SHE • Site Manager 	Construction

ENVIRONMENTAL ASPECT	IMPACT DESCRIPTION	MITIGATION MEASURES/ ACTIONS TO BE IMPLEMENTED	RESPONSIBLE PERSONS	PHASE/TIMEFRAME
REHABILITATION PHASE				

Vegetation	<ul style="list-style-type: none"> • Proliferation of invasive alien species. • Damage/destruction of flora 	<ul style="list-style-type: none"> • Re-vegetation of all the disturbed areas will be undertaken in accordance with a Rehabilitation Plan. An indigenous mix of predominantly pioneer plant seeds should be distributed over the soil in the disturbed area. The re-vegetated area should be visually monitored at least once a week and problem areas treated immediately. Continual monitoring will be undertaken to ensure that rehabilitation occurs of the disturbed areas is progressive. • Vegetation endemic to the area will be transplanted and used for the rehabilitation purposes. • Monitoring and active management can be stopped once rehabilitated areas reach sub-climax status, with at least 50% of the pre-construction species having established themselves and able to regenerate themselves. • All alien invasive species and declared weeds in terms of the Conservation of Agricultural Resources Act (Act 43 of 1983) will be systematically removed (manually) until the end of the contractual liability period in accordance with an approved plan. 	<ul style="list-style-type: none"> • SHE • Contractor 	Throughout the Rehabilitation Phase
Waste Management	<ul style="list-style-type: none"> • Littering • Proliferation of vermin • Visual and odour impacts 	<ul style="list-style-type: none"> • All post construction rubble will be disposed of at a licensed landfill site • All drainage structures will be cleared and monitored for occurrence of debris, silt and overgrowth of grass. 	<ul style="list-style-type: none"> • SHE • Contractor 	Rehabilitation

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Storm water Management	<ul style="list-style-type: none"> • Potential for occurrence of flooding • Potential for soil erosion 	<ul style="list-style-type: none"> • All storm water infrastructure will be monitored for potential blockages especially after rains. All debris observed around the storm water drains will be removed including the cutting/ trimming of any grasses growing around structures. 	<ul style="list-style-type: none"> • SHE 	Rehabilitation
Erosion	<ul style="list-style-type: none"> • Loss of top soil • Increased soil erosion 	<ul style="list-style-type: none"> • Any erosion channels developed during the construction period shall be backfilled and compacted and the areas restored to a proper condition. • All soils compacted as a result of construction activities, falling outside the construction footprint areas, should be ripped and profiled. 	<ul style="list-style-type: none"> • SHE • Contractor 	Rehabilitation

OPERATIONAL PHASE GUIDELINES

This EMPr has largely focused on the pre-construction, construction and rehabilitation phase of the project. The development is anticipated to be operational for more than 20 years, therefore Operational Plans will be compiled and updated as necessary by the proponent to ensure the viability of the lifespan of the facility. General aspects to be largely considered with regards to Operational Plans include the following:

- **Flora and fauna:** A Biodiversity Monitoring Plan should be established prior to the commencement of the operational phase of the project. Monitoring should be undertaken on a weekly basis around the site especially in the buffer area and also in the riverine area to ensure that there is minimal disturbance of flora and faunal habitats.
 - A Re-vegetation and Rehabilitation Plan should be compiled for usage by contractors and sub-contractors to rehabilitate disturbed areas. All translocated plants should be re-utilized for rehabilitation.
 - All alien vegetation should be eradicated within the study site especially within the natural grassland area. Removal of the alien and weed species encountered on the site must be undertaken in adherence to applicable legislation e.g. (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998).
- **Health and Safety:** Health and Safety Plans to be compiled should take cognisance with regards to the health and safety of workers and patrons, especially with regards to potential accidents and incidents. The following is also recommended:
 - Health and Safety awareness trainings should be held frequently with staff.
 - Any incidents occurring should be recorded and rectified. All records should be filed on site.
 - Personnel should be adequately trained on fire fighting and an adequate number of fire extinguishers should be placed in all relevant areas including the chalets.
 - Personnel should be trained on first aid including first aid regarding any swimming incidents or accidents. An adequate number of first aid boxes should be readily available and placed at all relevant areas at the venue.
 - Adequately qualified swimming instructors or personnel adequately skilled in swimming should be available at all times at the swimming pool facilities.
 - Adequately skilled health personnel should also be readily available at the venue.
 - Adequate signage regarding safety aspects should be placed strategically throughout the venue.
 - Access to the venue should be adequately controlled and monitored.
- **Water efficiency:** In order to conserve water resources the following must be strictly monitored
 - Usage of automated water sprinklers on vast landscaped areas for irrigation purposes;
 - Undetected losses from possible pipe leakages;
 - General water wastage by staff members.
 - Rainwater harvesting of water from roofs to be stored in tanks for general domestic use.

- **Waste Management:** An adequate number of bins should be placed at strategic points around the venue e.g. the site boundary northwards of the site towards the Hennops River, the marquee tent area, and the chalets to dissuade patrons from littering. The bins should be weather and vermin proof.
 - Adequate signage dissuading patrons from littering should be placed throughout the venue at strategic points.
 - Skip waste containers should be maintained on site and collected on a weekly basis from the site.
 - In as far as possible recycling of waste should take place and the sorting of waste at source is encouraged.
 - Weekly patrols of the venue are encouraged to ensure that the venue is kept clean.
- **Storm water:** The following measures must be considered for storm water management:
 - rainwater harvesting, inclusion of permeable pavements and parking areas; and soakaways.
Ongoing monitoring for the adequacy of storm water infrastructure must be undertaken frequently.
- **Energy efficiency:** Design measures of the facility should incorporate “green building techniques” in as far as practical. Energy efficiency measures to be considered can include the following:
 - Time switches should be used for outdoor lighting
 - Geysers must be fitted with insulation blankets
 - Solar panels can possibly be used for geysers and for outdoor lighting
 - Utilisation of natural lighting in as far as possible
 - Usage of generators

8. CONCLUSION

This EMPr will be reviewed by the SHE, Proponent and any other designated personnel on an on-going basis. Based on observations during site inspections and any other issues arising, the SHE will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site. Any such changes or updates will be registered in the SHE's record, as well as being included as an annexure to this document. The annexure must then be distributed to all relevant parties.

Although all foreseeable actions and potential mitigation measures or management actions are contained in this document, the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental standards, which would be required to minimise the negative impacts and maximise the positive benefits of the proposed development.

In order to achieve sustainable developments, mitigation measures must be discussed accordingly throughout the project lifespan. It is believed that should the recommendations stipulated in this EMPr be implemented the proposed development will be undertaken in an environmentally sustainable manner.